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Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

Claim 1 (canceled).

2 (currently amended). A device according to claim ~~1~~ 2 further comprising a tilt mechanism for controlling the orientation of said device.

Claims 3-7 (canceled).

8 (currently amended). A device according to claim ~~5~~ 9 wherein said fluid removal mechanism comprises a valve or a pump.

9 (previously presented). A device for conducting processing steps on a substrate comprising an array of chemical compounds on a surface thereof, said device comprising:

- (a) a housing comprising a housing chamber configured to retain any fluid introduced into said housing chamber, said fluid having a meniscus,
  - (b) an opening in said housing adapted for insertion into said housing chamber of a substrate having a surface comprising an array of chemical compounds,
  - (c) a fluid separation mechanism configured to separate fluid in said housing chamber from contact with said substrate in a controlled manner that preserves the integrity of the fluid meniscus at the atmosphere-fluid interface, wherein said fluid separation mechanism is a fluid removal mechanism for removing fluid from said housing chamber in said controlled manner,
- said fluid removal mechanism comprising a valve having a varying cross-section relative to height of fluid in said housing chamber,

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- (d) at least one inlet in fluid communication with said housing chamber, and
- (e) at least one outlet in fluid communication with said housing chamber.

10 (currently amended). A device according to claim 8 9 wherein said fluid removal mechanism comprises a pump having a constant displacement.

11 (currently amended). A device according to claim 1 9 further comprising a temperature controller.

Claim 12 (canceled).

13 (previously presented). A device according to claim 48 further comprising a pair of flexible members adjacent said wedge.

14 (currently amended). A device according to claim 1 9 further comprising a means for cooling a fluid.

15 (currently amended). A device according to claim 1 9 further comprising a heat exchanger for heating and/or cooling a fluid.

16 (currently amended). A device according to claim 1 9 further comprising a solvent vapor generator.

Claim 17 (canceled).

18 (currently amended). A device according to claim 1 9 wherein said array is a biopolymer array.

Claims 19-28 (canceled).

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29 (previously presented). A method for performing a step of a hybridization reaction on the surface of a substrate, said method comprising:

(a) inserting a substrate comprising an array of chemical compounds on a surface thereof into a housing chamber of a device for conducting processing, the device comprising a housing comprising a housing chamber configured to retain fluid, and an opening in said housing adapted for insertion into the housing chamber of the substrate, and

(b) introducing a fluid reagent for performing said step into said housing chamber, and

(c) removing said fluid reagent from contact with said substrate in a manner causing surface tension of said fluid in conjunction with a level of hydrophobicity or hydrophilicity of said surface of said substrate to limit formation of isolated droplets of said fluid separate from a major mass of said fluid in said housing chamber.

30 (previously presented). A method according to claim 29 wherein said step is washing said surface and/or drying of said surface.

31 (previously presented) A method according to claim 29 wherein said removing is carried out by lifting said substrate from said housing.

32 (original). A method according to claim 29 wherein said removing is carried out by a removal mechanism selected from the group consisting of (i) a valve having a varying cross-section relative to height of fluid in said housing chamber and (ii) a pump having a constant displacement.

33 (previously presented). A method for performing a step of a hybridization reaction on the surface of a substrate, said method comprising:

(a) inserting a substrate comprising an array of chemical compounds on a surface thereof into a housing chamber of a device comprising:

a housing comprising a housing chamber configured to retain fluid introduced into said housing chamber, said fluid having a meniscus,

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an opening in said housing adapted for insertion into said housing chamber of a substrate having a surface comprising an array of chemical compounds,  
a fluid separation mechanism configured to separate fluid in said housing chamber from contact with said substrate in a controlled manner that preserves the integrity of the fluid meniscus at the atmosphere-fluid interface,

at least one inlet in fluid communication with said housing chamber,  
and

at least one outlet in fluid communication with said housing chamber,  
(b) introducing a fluid reagent for performing said step into said housing chamber,

(c) removing said fluid reagent from contact with said substrate in a controlled manner at a rate that substantially eliminates formation of droplets of said fluid on said surface of said substrate, and

(d) introducing a fluid vapor into said housing chamber during said removing to assist in drying said substrate surface.

34 (original). A method according to claim 33 wherein said fluid vapor is a vapor of an organic solvent.

35 (original). A method according to claim 29 further comprising tilting said device during said removing.

36 (previously presented) A method according to claim 29 wherein said substrate is part of a sealed hybridization chamber and said method comprises disassembly of said hybridization chamber in the presence of disassembly buffer.

Claims 37-45 (canceled).

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46 (previously presented). A flow device comprising:

(a) a reaction chamber having an opening for insertion of a substrate into said reaction chamber, said substrate having a cover slide over a surface thereof wherein said surface comprises a plurality of biopolymers, and

(b) a separator mechanism for separating said substrate surface from said cover slide while in said reaction chamber without damage to said biopolymers on said surface, said separator mechanism comprising a pair of flexible members having a wedge member therebetween disposed to insert between and separate said substrate surface from said cover slide.

Claim 47 (canceled).

48 (currently amended) The device of claim ~~1~~, 9 further comprising a wedge positioned to insert between and separate a sandwich of said substrate and a cover slide positioned in said housing chamber to expose said surface of said substrate to fluid within said housing chamber.

49 (previously presented) The flow device of claim 46, wherein said separator mechanism is configured to separate said substrate from said cover slide to expose said plurality of biopolymers to fluid within said housing chamber.

50 (previously presented). The flow device of claim 46, wherein said wedge member is positioned to separate said substrate from said cover slide to expose said plurality of biopolymers to fluid within said housing chamber.

51 (currently amended). The device of claim ~~1~~, 9, further comprising a wedge positioned to insert between and part a sandwich of said substrate and a cover slide positioned in said housing chamber to expose said surface of said substrate to fluid within said housing chamber.

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52 (previously presented) The flow device of claim 46, wherein said separator mechanism is configured to part said substrate from said cover slide to expose said plurality of biopolymers to fluid within said housing chamber.

53 (previously presented). The flow device of claim 46, wherein said wedge member is positioned to part said substrate from said cover slide to expose said plurality of biopolymers to fluid within said housing chamber.

54 (currently amended). The device of claim 1 9, wherein said ~~computer controls said fluid separation mechanism to~~ controlled manner provides for a constant velocity of flow of fluid during its removal from the housing chamber.

55 (currently amended). The device of claim 1 9, wherein said ~~computer controls said fluid separation mechanism to~~ controlled manner provides for a constant velocity of movement of the fluid's meniscus.